BIOPHYSICAL COMPUTING DEVICES

(BCD CORP.)

A description of a new concept company
that will research, develop and produce
patented biofeedback equipment. (1)

1971

---

(1) A device that provides knowledge of the results of any behavior considered as influencing or modifying further performance by the organism.

INDEX

Part #	Topic	Page #
1	Introduction	
2	The Company	
3	The Products	
4	The Market	
5	The Competition	
6	The Finances	
7	Appendixes	

Introduction:

Biophysical Computing Devices (BCD) originated in early 1971, predicated on scientific discoveries made by David Rosenboom - (see resume appendix A).

Prior to this breakthrough, similar equipment currently in use by the psychological and medical professions ranged in price from $6000 to $40,000. Our patentable devices which have already been prototyped and authenticated would be marketed in the price range of $100 to $1000.

A major feature of the product is its encapsulated modular basic biomedical circuit elements, (see appendix B), which permits greater diversification at reduced production costs.

The annual domestic market for these products have been estimated at a total of $400 million and is increasing at the rate of 11% per year. (1) (see page 4, description of products).

---

(1) 1970 McGraw-Hill Survey.

The Company

Key officers and/or directors of the corporation are:

David Rosenboom	President Director
Dr. Edgar Coons	Director
Jon Hassell	Director
Rubin Gorewitz	Treasurer Director
Margaret Krimsky Hassell	Secretary Director
Marketing Man	Vice President
Production Engineer	Vice President

See appendix A for resumes.

The Products:

Physiologists and physiological psychologists discovered many years ago that it is possible to monitor many of the activities of the body by sensing and analyzing the tiny internal electrical impulse activity that is associated with these responses. Those measurements that are commonly known are the electrocardiogram (heart activity), electroencephalogram (brain activity), electromyogram (muscle activity), nystagmogram (eye movement activity), gastric motility, blood flow volume, and many others. These techniques have become of immeasurable value in the application of modern medicine and psychology and are central to today's research activities. Many of these responses of the body have been, until now, considered within the province of the autonomic nervous system, that is, not able to be brought under conscious control. In order to bring about desired changes in these responses it has been necessary to rely on such things as drugs. New studies have shown, however, that this is no longer the case.

At the present time the internal body actions can be measured on sensitive electronic instruments that detect the internal response and converts the response into sound, lights or movements on a dial. Our authenticated product, now makes it possible for the first time at this price, to allow the individual to become aware of his own body responses and learn to control them.

The technique by which a person can listen to his own internal processes is termed bio-feedback. By use of bio-feedback a person can learn consciously to control these ordinarily unconscious internal processes. Many current research efforts, (the inventor has participated in some of these), are showing that such controls are being achieved. This new tool is presently being used for treatment of psychosomatic disorders. Learned control of these responses by the brain is being tried as a means to curb body ills, such as some cardiovascular and intestinal tract disorders. One of the areas receiving the most publicity currently is brain bio-feedback in which a certain pulsation produced by the brain which is detectable on the surface of the scalp, (termed "Alpha"), is brought under self-control, producing mood changes and altered states of consciousness.

To undergo such an experience with the devices we have developed, one would merely place two tiny self adhering electrodes against his scalp in prescribed locations, and connect them to a small portable bio-feedback unit (6 ounces) which can be worn or carried. When his brain produces "Alpha waves" his bio-feedback device produces a tone and/or a light indicating the presence of "Alpha". As this continues the person will slowly learn what he is manipulating internally that produces "Alpha" and how to control it consciously. This leads to increased self-mastery which is valuable in the therapeutic and simply exploratory situations. Production of "Alpha" is related to reduction of anxieties and maintaining a state of relaxed alertness.

Another situation would be a doctor who is training a patient, suffering from a dangerous disturbance in his heart rhythm, to maintain a normal heart beat merely by mental effort. In this instance the equipment would be very similar: a light flashing or tone sounding when the beat is correctly maintained. Other examples would include training of responses of the kidney, the uterus, blood pressure, muscle tension, and uncontrolled spasmodic conditions. In short, when medical procedures for our new products are perfected, doctors will have a powerful new tool for treatments with little danger of side effects, especially in cases where there are adverse reactions to drugs,and individuals will have additional techniques for development of self-regulation as a way to increase their human effectiveness. (see appendix D for references to articles about further applications).

Our unique patentable electronic equipment breakthroughs have produced several basic biomedical circuit elements that will 1) apply to all types of bio-electronic measuring techniques such as thosedescribed above, 2) do so at significantly reduced costs and with increased accuracy and reliability over those currently available, 3) facilitate the implementation of complete bio-feedback systems and 4) facilitate sales to the general public as well as professional markets.

The company will market a line of products as follows:

Product 1: BIOMEDICAL OPAMP, used to amplify and condition all types of bio-electronic signals for monitoring and/or analysis.

Product 2: BIOELECTRONIC SIGNAL DETECTOR/ANALYZER, used to detect and analyze all types of bioelectronic signals from the body. Technically speaking, it can perform operations such as frequency/amplitude descriminations with presetable bandwidths as narrow as 1 Hz in any range, (1) locate spectral energy distribution in input waves, (2) facilitate signal averaging and histograms,(3) perform modulation peak detection,(4) and provide suitable output indication for detection of desired signal conditions and time spent in such conditions.(5) Measurements of this type are currently available only on devices costing significantly more.

---

(1) The device can be set to "pass" only signals which are of specified fundamental frequency, amplitude and wave shape characteristics and reject those that deviate as little as 1 cycle per second (Hz) or it can be made to "pass" wider bands.

(2) The device can provide output which shows how much energy of the wave being measured is distributed among the various higher harmonics of the fundamental frequency.

---

(3) Correlation functions which show the statistical character of input waves.

(4) Is used for evoked potential work where a signal from the brain is measured which is a response to some stimulus to the organism and for detection of energy diversion which is a result of non-linear action in the brain.

(5) Signals for triggering feedback generators, (see Product 3), for input to computers or for indicating the percent of time per minute spent by an individual producing a desired response.

PRODUCT 3: BIOLOGICAL FEEDBACK GENERATOR, OUR DEVICE USED TO PROVIDE TYPES OF VISUAL OR AURAL INDICATIONS NECESSARY IN ALL BIO-FEEDBACK TRAINING SYSTEMS.

PRODUCT 4: INPUT TRANSDUCERS, WHICH CAN BE ATTACHED TO MEASURE INDIRECT ELECTRONIC PHENOMENA SUCH AS BAROSENSOR READINGS OF BLOOD PRESSURE.

PRODUCT 5: LOW COST HIGHLY EFFECTIVE SELF ADHERING ELECTRODES, (1/10 OF AN OUNCE) USED TO MONITOR ALL TYPES OF INTERNAL ELECTRONIC BODY SIGNALS.

THE PRODUCT DEVELOPMENT FALLS INTO FOUR BROAD CATEGORIES: 1) HOSPITAL AND RESEARCH DEVICES, 2) MASS APPEAL DEVICES, 3) BIO-FEEDBACK COMPUTER SOFTWARE DEVELOPMENT PACKAGES AND 4) EVENTS AND PROGRAMS EXPLOITING THE PUBLIC INTEREST IN THESE DEVELOPMENTS. THE DIFFERENCE BETWEEN ITEMS 1 AND 2 IS ONLY IN THE PACKAGING, AMOUNT OF DEVICE CONTROL OFFERED TO THE USER AND IN PROMOTIONAL TACTICS.

ENCAPSULATED CIRCUITRY AND INTEGRATED CIRCUITS ARE OF PRIME IMPORTANCE. ALL DEVICES WILL BE WEARABLE, EXTREMELY SMALL AND SIMPLE TO OPERATE, AND RUN ON LOW-POWER. A SERIES OF MODULAR PRODUCTS USING THE SAME ENCAPSULATED OR INTEGRATED CIRCUITS BUT PRESENTED IN DIFFERENT PACKAGING SCHEMES, MORE APPROPRIATE FOR RESEARCH AND DEVELOPMENT, WILL ALSO BE OFFERED. ALL DEVICES ARE INTEGRATED INTO A MODULAR SYSTEM FOR PLUG-TOGETHER SIMPLICITY OF OPERATION AND EXPANSION OF SYSTEMS.

Some further product concepts that fall within the inventor's present research areas are:

A) Wearable comprehensive "biocomp", a watch sized biological computer giving feedback from a complete electro-psychophysiological scan of the entire organism, only possible by utilizing our new circuit developments.

B) Attention monitoring devices for application in teaching machine situations; analysis of visual and aural pattern information in such things as art and advertising content; an alarm that sounds when an automobile driver is not paying attention to his driving; when a radar operator's mind wanders, etc.

C) More comprehensive exercise over exertion alarms than those already existing giving warning when dangerous strain is being put on one or more body systems.

D) Applications in many therapeutic and perceptual learning areas. Some systems using bio-feedback in music therapy have already been set up by the inventor who is currently a consultant to the New York City Board of Education on a project to explore bio-feedback training as an aid to creative learning, helping hyperactive students and students with drug problems. A proposal for supporting funds has been submitted by the New York City Board of Education titled, A Pilot Study of the Relationship Between Conditioned Brain Alpha Rhythm Self-Control and Maladaptive Student Behavior, which is based on use of devices developed by the inventor.

The Centre for Gestalt Learning of Canada has used the devices in conjunction with seminar sessions in group encounter, self development, and musical perception.

e) Interface to video and sound pattern generating systems.

The inventor is also currently developing a computer software package enabling sophisticated analysis of bioelectronic data and generation of feedback patterns, both visual and aural, from very specific psychophysiological information, the conscious control of which is being learned by a subject. Appendix C, HOMUNCULAR HOMOPHONY, was prepared by the inventor for presentation to the 1971 Spring Joint Computer Conference, Atlantic City and to the 1971 Audio Engineering Society Convention, Los Angeles and presented on a recent extensive lecture tour of the United States and Canada. It is being published in the Audio Engineering Society Journal.

An additional project for education in the arts, using the inventor's bio-feedback equipment, has been proposed by the Space for Innovative Development in New York to investigate the psychophysical correlates of esthetics.

The Market:

The following is a selected list of representative companies presently manufacturing professional biomedical electronic equipment that relates to the equipment herein discussed. None of them are yet manufacturing bio-feedback devices specifically. Included with each name are figures indicating the number of employees in the company, the number of engineers employed by the company and the annual dollar volume of sales. The list is not meant to be complete for the field, merely representative.*

Bioelectronic Instruments Inc., Emp 15 Eng 3 $100-250M
Bio-Medical Electronics Inc., Emp 25 Eng 6 $250-500M
Bioneers Inc., Emp 4 Eng 2 up to $100M
Bionic Instruments Inc., Emp 16 Eng 3 $100-250M
Bio-Rad Laboratories, Emp 100 Eng 4 $2,000-5,000M
Beckman Instruments Inc., Emp 7450 over $10,000M
Clevite Corp., Brush Inst. Div., Emp 700 Eng 200 $10,000M estimated
Nippon Electric, $10,000M
Nihon Kohden Kogyo Co., Ltd., Emp 1000 Eng 450 over $10,000M
Coldspring Inst. Corp., Emp 10 Eng 3 $250-500M
Ensco Medical Eiv. Fluidics Prod. & Sales Inc. Emp 20 Eng 3 $35
Hewlett-Packard, Emp 1300 Eng 1600 over $10,000M
Honeywell Test Inst. Div., no figures available
Lehigh Valley Electronics Inc., Emp 77 Eng 9 $1,000-2,000M
Mennen-Greatbatch Electronics Inc., Emp 165 Eng 5 $2,500-5,000M
San-Ei Inst. Co. Ltd., Emp 500 Eng 200 $5,000-10,000M
Unimetrics Corp., Emp 5 Eng 3 $100-250M
London Co., Emp 50 Eng 1 $250-500M estimated
Newport Labs Inc., Emp 20 Eng 6 $250-500M
Teca Corp., Emp 30 Eng 4 $500-1,000M

*Based on McGraw-Hill survey published 1970.

THE MARKET FOR OUR DEVICES WOULD FALL INTO THREE CATEGORIES: 1) PROFESSIONAL TRADES, 2) OEM (ORIGINAL EQUIPMENT MANUFACTURER) IN THE BIOELECTRONIC FIELD AND 3) INDIVIDUAL USERS.

THE PROFESSIONAL TRADE MARKET CONSISTS OF HOSPITALS, UNIVERSITIES, RESEARCH INSTITUTIONS, CLINICS, PSYCHOLOGICAL INSTITUTES, EDUCATIONAL INSTITUTIONS AND INDIVIDUAL PSYCHOLOGICAL AND MEDICAL PRACTITIONERS, WHO WOULD USE OUR DEVICES FOR PSYCHOLOGICAL AND MEDICAL RESEARCH AND FOR THERAPIES DEVELOPING PRINCIPALLY FROM BIO-FEEDBACK. SEVERAL INSTITUTIONS ARE ALREADY USING THIS TYPE EQUIPMENT THAT HAS BEEN SET-UP BY THE INVENTOR. A MAJOR RESEARCH HOSPITAL IN THE NEW YORK AREA HAS AGREED TO PUBLISH A FAVORABLE REPORT WHICH WILL FURTHER AUTHENTICATE OUR COMPANY'S DEVICES AS WELL AS COMPARE THEM WITH PRODUCTS NOW IN USE AT THEIR INSTITUTION.

BECAUSE OF THE BASIC NATURE OF OUR ENCAPSULATED BIOMEDICAL ELECTRONIC ELEMENTS THEY ARE NEEDED BY OTHER MANUFACTURERS(OEM) AS COMPONENTS IN THEIR EQUIPMENT.

THESE DEVICES WILL ALSO BE SOLD DIRECTLY TO INDIVIDUAL USERS AS DEVICES FOR PERSONAL EXPLORATION.

Competition:

There are several small companies, notably Psychophysics Labs, Phenomenological Systems Inc., and Alpha-Metrics Inc., which are attempting to market non-professional devices, (for "Alpha" wave feedback only), to the general public. Our product bears little relation to these. One company, Bio-Feedback Technology, Inc., is marketing more professional devices, specifically for EEG (brain wave) feedback. Most professionals who work in bio-feedback now construct their own systems using standard EEG or EKG equipment (not specifically designed for bio-feedback), with auxilliary devices. Some of the largest companies manufacturing this type of equipment are Brush Instruments Division of Clevite Corp., Beckman Instruments Corp., and Hewlett-Packard Corp.

THE FOLLOWING CHART SHOWS A COMPARISON OF OUR PRODUCT VERSUS COMPETITORS' PRODUCTS:

The following is a comparison chart of features offered and prices of equipment currently on the market and this companies devices. The samples of existing equipment are taken from two examples of companies from which our company could expect the most direct competition:

	Ours	Brush Inst. Div of Clevite Corp.	Bio-Feedback Tech Inc.
Designed specifically for Bio-Feedback work.	Yes	No	Yes
Applies to all types of bioelectronic signals, (EEG, EKG, EMG, etc.).	Yes	Yes	No
Is portable.	Yes	No	Yes
Can be worn by user.	Yes	No	No
Can be packaged for use by public as well as by professionals.	Yes	No	Yes
Uses basic encapsulated bioelectronic circuit elements applicable to OEM market in the bioelectronic medicine and research fields.	Yes	No	No
No extra equipment needed to facilitate complete biofeedback system.	Yes	No	Yes
Facilitates sophisticated analysis such as, spectral energy distribution, signal averaging, histograms, modulation peak detection, etc.	Yes	No	No
Set up for direct computer input of detection signals from prescribed signal conditions.	Yes	No	No
Provides integrated average output of % time spent in correct feedback states.	Yes	No	No
Designed for evoked potental neurological research as well as feedback of ongoing signals, (used in studies of perception and neurophysiology).	Yes	No	No

	Ours	Brush Inst. Div. of Clevite Corp.	Bio-Feedback Tech. Inc.
Has highly controllable selectivity, (ie. bandwidth variable down to 1 Hz).	Yes	No	No
Detects signals over extremely wide range, (moveable center frequency over complete range).	Yes	No	No
Has variable delayed feedback option.	Yes	No	No
Includes graphic readout of data.	No	Yes	No
Can connect to standard graphic devices such as oscilloscopes and chart recorders directly.	Yes	Yes	Yes
Approximate price of comprehensive bio-feedback training system, (at least three channels of data, EEG and EKG).	$600	$20,000	$5,100
Approximate price of one channel feedback system	$200 (applies to all types of feedback)	$5,000 (EEG only)	$1,700 (EEG only)

THE FINANCES:

THERE ARE SEVERAL ALTERNATIVES AVAILABLE IN THE DECISION AS TO THE BEST METHOD OF FINANCING THE COMPANY. THE IDEAL METHOD WOULD BE TO MANUFACTURE AND MARKET A SUFFICIENT QUANTITY IN ONE REGIONAL TEST MARKET AREA AND THEN APPLY A MULTIPLE TO DETERMINE THE NATIONAL MARKET. THE PATENTED PRODUCT COULD THEN BE SOLD TO A NATIONAL MEDICAL COMPANY. THE INVENTOR WOULD THEN START DEVELOPING THE SUCCEEDING PROTOTYPE PRODUCTS WITH THE AIM OF SELLING A NEW REGIONAL TEST MARKET PRODUCT EACH YEAR.

IT IS ANTICIPATED THAT WITH AN INITIAL OUTLAY OF $350,000 TO TAKE THE FIRST PRODUCT INTO TEST MARKET, EACH PRODUCT COULD THEN BE SOLD FOR APPROXIMATELY $3,000,000 WHICH WOULD BE THE SOURCE OF FUNDS TO PRODUCE AND TEST MARKET NEW GENERATION PRODUCTS.

THE OTHER ALTERNATIVE IS TO SELL THE PROTOTYPE TO A MANUFACTURER FOR $500,000 AFTER PRODUCTION COST OUTLAYS OF APPROXIMATELY $150,000.

THE COST TO MANUFACTURE AND MARKET NATIONALLY WOULD EXCEED AN OUTLAY OF $1,000,000. A VENTURE OF THIS TYPE COULD BE ACCOMPLISHED INDEPENDENTLY WITH PRIVATE VENTURE CAPITAL OR ON A JOINT VENTURE BASIS WITH A COMPATIBLE MANUFACTURER.

THE FOLLOWING SCHEDULE SHOWS A THREE YEAR PROJECTED PROFIT AND LOSS STATEMENT AND CASH FLOW. THE CONSERVATIVE SALES FORECASTING REPRESENTS AN ANNUAL AVERAGE OF CAPTURING 1/2 OF 1% OF THE DOMESTIC NATIONAL MARKET.

BCD CORP.

SALES PROJECTION IN THOUSAND OF DOLLARS

	FIRST YEAR				
	1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.	TOTAL
SALES			500 100	900 180	1500 280
MANUFACTURING COSTS			30	36	66
GROSS PROFIT			70	144	214
SALARIES	10	18	18	24	70
OVERHEAD	5	7	8	10	30
PROMOTION & ADVERTISING		5	10	15	30
RESEARCH & DEVELOP.	20	3	3	4	30
COMMISSIONS			20	36	56
PROTOTYPE COSTS	1	3	3	3	10
TOTAL OPERATING EXPENSES	36	36	62	92	226
PROFIT (LOSS)	(36)	(36)	8	52	(12)
CUMULATIVE PROFIT(LOSS)		(72)	(64)	(12)	
CASH FLOW–					
SALES				100	100
MANUFACTURING COSTS		30	36	60	126
EXPENSES	36	36	62	92	226
TOTAL	36	66	98	152	352
CASH REQUIRED	36	66	98	52	252
CUMULATIVE	36	102	200	252	
INVESTMENT 300	264	198	100	48	

BCD CORP.
SALES PROJECTION IN THOUSAND OF DOLLARS

SECOND YEAR

	1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.	TOTAL	1ST & 2ND YEAR
SALES	1500 300	2000 400	2600 520	3400 680	9500 1900	11000 2180
MANUFACTURING COSTS	60	80	104	136	380	446
GROSS PROFIT	240	320	416	544	1520	1734
SALARIES	30	35	40	45	150	220
OVERHEAD	10	12	13	15	50	80
PROMOTION & ADVERTISING	20	20	20	20	80	110
RSEARCH & DEVELOP.	10	10	10	10	40	70
COMMISSIONS	60	80	104	136	380	436
PROTOTYPE COSTS	5	5	5	5	20	30
TOTAL OPERATING EXPENSES	135	162	192	231	720	946
PROFIT(LOSS)	105	158	224	313	800	788
CUMULATIVE PROFIT (LOSS)	93	251	475	788		

CASH FLOW

	1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.	TOTAL	1ST & 2ND YEAR
SALES	180	300	400	520	1400	1500
MANUFACTURING COSTS	80	104	136	160	480	606
EXPENSES	135	162	192	231	720	946
TOTAL	215	266	328	391	1200	1552
CASH REQUIRED	35	(34)	(72)	(129)	(200)	52
CUMULATIVE	287	253	181	52		
INVESTMENT 300	13	47	119	248		

BCD CORP.

SALES PROJECTION IN THOUSAND OF DOLLARS

	THIRD YEAR					
	1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.	TOTAL	1ST, 2ND & 3RD YEAR.
SALES	4000 800	4800 960	5700 1140	6700 1340	21200 4240	33200 6420
MANUFACTURING COSTS	160	192	228	268	848	1294
GROSS PROFIT	640	768	912	1072	3392	5126
SALARIES	50	55	60	65	230	450
OVERHEAD	17	18	20	22	77	157
PROMOTION & ADVERTISING	20	20	20	20	80	190
RESEARCH DEVELOP.	10	10	10	10	40	110
COMMISSIONS	160	192	228	268	848	1284
PROTOTYPE COSTS	5	5	5	5	20	50
TOTAL OPERATING COSTS	262	300	343	390	1295	2241
PROFIT (LOSS)	378	468	569	682	2097	2885
CUMULATIVE PROFIT (LOSS)	1166	1634	2203	2885		
CASH FLOW						
SALES	680	800	960	1140	3480	5080
MANUFACTURING COSTS	192	228	268	320	1008	1614
EXPENSES	262	300	343	390	1295	2241
TOTAL	454	528	611	710	2303	3855
CASH REQUIRED	(226)	(272)	(349)	(430)	(1177)	(1225)
CUMULATIVE	(174)	(446)	(795)	(1225)		

INVESTMENT 300

INITIAL ACTIVITIES

THE TIME REQUIRED TO BRING THE PRODUCTS HEREIN DESCRIBED TO THE FINISHED, PACKAGED PROTOTYPE STAGE READY FOR MANUFACTURE IS APPROXIMATELY SIX MONTHS. MOST OF THE START UP NEEDS WOULD CENTER AROUND ESTABLISHING AN ELECTRONICS MEASUREMENT-COMPUTATION LAB AND PRODUCTS TESTING FACILITY AND PREPARATION OF PROMOTIONAL LITERATURE. CERTAIN PARTS OF THE MANUFACTURING PROCESS WOULD BE SUBCONTRACTED TO OTHER FIRMS, SUCH AS PRINTED CIRCUIT FABRICATION AND ENCAPSULATION.

PRINCIPAL INITIAL ACTIVITIES WOULD BE SUMMARIZED AS:

FIRST QUARTER

1. PLANT AND OFFICE FACILITIES ESTABLISHED.
2. PERSONNEL RECRUITED.
3. TWENTY MINUTE FILM DISCUSSING BIO-FEEDBACK IS ALREADY COMPLETED AND WOULD BE SHOWN TO POTENTIAL USERS.
4. LABORATORY EQUIPMENT ORDERED.
5. PREPARATION OF PROMOTIONAL LITERATURE.
6. END OF QUARTER, FULL TIME FIVE EMPLOYEES.

SECOND QUARTER

1. WORK CONTINUED ON PROMOTIONAL MATERIALS AND MARKETING MAN HIRED.
2. LABORATORY SET-UP IS COMPLETED AND PROTOTYPING WORK PROGRESSES.
3. STRONG MARKETING EFFORT IS BEGUM WHEN FINISHED PROTOTYPES ARE AVAILABLE.
4. MANUFACTURING PROCESSES AND QAULITY CONTROL PROCEDURES ARE DESIGNED.
5. AUTHENTICATING AND COMPARISON STUDIES ARE DONE ON PROTOTYPE BY LARGE RESEARCH HOSPITAL, RESULTS TO BE PUBLISHED ANDINCLUDED IN PROMOTION.
6. DEMONSTRATION PLACE FOR BIO-FEEDBACK TECHNIQUES IS SET-UP AT PLANT TO HELP EDUCATE USERS AND DEMONSTRATE UNITS TO CUSTOMER.

Third Quarter

1. Orders are taken and manufacturing begun.
2. Marketing effort intensified, principly in bio-medical electronics users field.
3. One employee added.

Fourth Quarter

1. Marketing effort intensified and expanded into OEM electronic market, (to be expanded into public market in following year).
2. Manufacturing continues.
3. Further cost reduction research begun, (research on new products to be begun in following year).

Likely Initial Customers

The inventor has received many inquiries from hospitals who would like to be able to make bio-electronic measurements of the type facilitated by our equipment on many patients at once but can not do so because of the high cost of available equipment. These hospitals would be likely initial customers. Also, a large number of research institutions and mental health institutions would like to undertake more bio-feedback research than is currently economically feasable with available equipment. As sales to these groups are made, it is felt that the individual practioner will begin to use the equipment as well. The public market would be pursued later as publicity is generated attesting to the products medical authentication.

APPENDIXES:

APPENDIX A:	RESUMES
APPENDIX B:	DRAWINGS OF BASIC ENCAPSULATED BIOMEDICAL ELECTRONIC CIRCUIT ELEMENTS, (ACTUAL SIZE)
APPENDIX C:	HOMUNCULAR HOMOPHONY
APPENDIX D:	OTHER ARTICLES AND LETTERS

multi-media

and in physiological psychology at NYC

APPENDIX A: RESUMES

DAVID ROSENBOOM: DAVID ROSENBOOM'S FORMAL TRAINING TOOK PLACE IN MUSIC, PHYSICS AND COMPUTER SCIENCE WITH PRIVATE TEACHERS AND AT THE UNIVERSITY OF ILLINOIS WHERE HE WAS ELECTED AN EDMUND J. JAMES SCHOLAR. HE WAS ACTIVE IN THE EARLY DEVELOPMENTS OF USING COMPUTERS IN THE INTERMEDIA ARTS AND IN DEVELOPMENT OF ELECTRONIC MUSIC SYNTHESIZERS. HE WAS A ROCKEFELLER FELLOW AT THE CENTER FOR CREATIVE AND PERFORMING ARTS IN THE STATE UNIVERSITY OF NEW YORK AT BUFFALO AND LATER ARTISTIC COORDINATOR OF New York's THE ELECTRIC CIRCUS AND A DIRECTOR OF THE ELECTRIC EAR SERIES IN MULTI-MEDIA. HE HAS PERFORMED AND RECORDED WIDELY AS an instrumental SOLOIST AND CONDUCTOR OF MAJOR ORCHESTRAS AND WITH CONTEMPORARY MUSIC GROUPS. HIS COMPOSITIONS, FOR WHICH HE HAS HELD MANY COMMISSIONS, HAVE BEEN PERFORMED WIDELY ON MAJOR FESTIVALS AROUND THE WORLD AND HE HAS COMPOSED MUSIC FOR MANY FILMS, TELEVISION SHOWS AND COMMERCIALS. IN 1969 HE FOUNDED AND BECAME PRESIDENT OF NEURONA COMPANY, AN ELECTRONIC R&D GROUP IN NEW YORK WHICH SUCCESSFULLY DEVELOPED AND SOLD NEW TECHNIQUES FOR ELECTRONIC MUSIC SYNTHESIS. ~~MOST~~ He was ~~RECENTLY AS DIRECTOR OF COMPUTER AND ELECTRONIC MEDIA RESEARCH IN THE FACULTY OF FINE ARTS OF YORK UNIVERSITY (TORONTO) HE INITIATED A NEW EDUCATIONAL CIRCULUM IN INTERMEDIA AND~~ the first director of the Electronic Media studios at York when he composed new music CARRIED OUT RESEARCH IN COMPUTER METHODS USED IN PSYCHOPHYSICS ~~AND~~ investigations of THE ARTS. HE HAS RECEIVED MANY ACADEMIC AWARDS, LECTURED WIDELY, AND HAS PUBLISHED MANY MUSICAL COMPOSITIONS, ARTICLES ON INTERMEDIA AND SCIENTIFIC PAPERS ON COMPUTER APPLICATIONS, SYSTEMS THEORY AND BIO-FEEDBACK TECHNIQUES. HIS WORK IS DISCUSSED IN SEVERAL CURRENT BOOKS ABOUT NEW DIRECTIONS IN THE ARTS, AND COMPUTER SCIENCE AND BRAIN research and HAS RECEIVED GENEROUS PRESS AND TV COVERAGE. ~~HE IS AUTHER OF A FORTHCOMING BOOK, SYSTEMS THEORETICAL APPROACH TO ART MEDIA, AND HAS WRITTEN AND APPEARED IN A TELEVISION SERIES FOR CANADIAN TV TITLED, IMAGERY OF THE NEW MEDIUM.~~ HE HAS CONSULTED TO MANY EDUCATIONAL INSTITUTIONS AND CORPORATIONS ON ELECTRONICS, ~~AND~~ COMPUTERS, Psychology and the arts ~~TOPICS AND IS A GUEST EDITOR OF SYNTHESIS MAGAZINE.~~ HIS CURRENT RESEARCH EFFORTS IN BIO-FEEDBACK HAVE RESULTED IN NEW METHODS OF RELATING BRAIN ACTIVITY TO INVESTIGATIONS OF ESTHETICS AND IN SEVERAL BREAKTHROUGHS IN THE ELECTRONIC TECHNOLOGY INVOLVED, ~~UPON WHICH THIS COMPANY IS PREDICATED. HE HAS STRONG INTERESTS IN NEW METHODS IN HIGHER EDUCATION AND IS CONSULTANT FOR THE INTERMEDIA INSTITUTE, INC. IN NEW YORK. IN ADDITION TO FORMING THIS COMPANY, HE PLANS TO UNDERTAKE WORK TO COMPLETE A PH.D. IN PHYSIOLOGICAL PSYCHOLOGY UNDER DR. LLOYD KAUFMAN AT NEW YORK UNIVERSITY IN THE IMMEDIATE FUTURE.~~

and he is working with a new musical group which will perform a major new composition in collaboration with artist Robert Breuln in Licoln Center during the 72-73 season.

He has frequently appeared to discuss and demonstrate his work on the Mike Douglas and David Frost shows and has written, appeared in and composed music for special productions of the ABC, CBS, PBL, NET, Westinghouses, BBC, Canadian ETV and CTV networks.

is a member of an advisory committee of the A-A-A-S on science and the arts and education research consultant to the NYC B of E consultant to + featured artist of the I.I.I. in N.Y., and has been consultant to Towns, Inc. and NIPPON GAKKI CO. as well as many other companies + universities.

He is listed in the new edition of Baker's Biographical Dictionary of Musicians + in

Jon Hassell: Earned degrees from the Eastman School of Music at the University of Rochester. After spending several years in Europe on a German Government grant to study electronic music with Karlheinz Stockhausen, he returned to the United States as a Rockefeller fellow at the Center for the Creative and Performing Arts at the State University of New York at Buffalo. Performing, recording, publishing, and the creation of sculpture combining sound and visual phenomena were his activities there. After moving to New York, his experimentation with color television led to the origination of a new genre of optical devices which instantly transform normal television images into continually-changing abstract patterns. He formed Light Years, Inc. (of which he is President) early in 1970 to manufacture and distribute these and other television-related products, one of which is presently being used by RCA for color TV display. His present interest is in using business creatively for the enhancement of new life-styles.

Margaret Krimsky Hassell: A graduate of the Eastman School of Music at the University ofRochester. Besides serving on the faculties of several universities and music schools, she has performed in Europe and the United States both as soloist and as a member of several chamber ensembles, including the Ars Novo Trio. She has recorded piano music for the West German Radio and appears on Columbia Records as a performer in Terry Riley's IN C. Her business experience began in 1969 as Assistant to Regional Sales Director at Columbia Artists Management. She now performs a wide range of administrative duties as an officer and Board Member of Light Years, Inc. in New York.

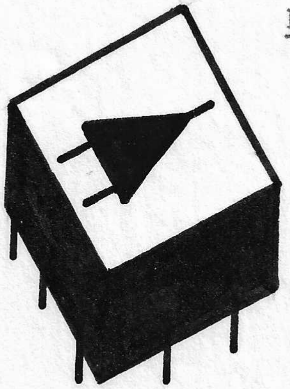
Rubin Gorewitz: CPA (New York 1953) is listed in Who's Who in the East and in Who's Who in the World of Finance and Industry.

Dr. Edgar Coons: Majored in music at Colorado College and Yale but obtained his Ph.D. in psychology under Neal Miller, (one of the founders of bio-feedback), at Yale. Now an Associate Professor of Physiological Psychology and Chairman of the Washington Square College Psychology Department of New York University, he does research in electrical stimulation of the brain and behaviorally studies how messages are transmitted through the nervous system. As an avocation, he enjoys acting as a catalyst in uniting art and science. He introduced David Rosenboom to the musical possibilities of bio-feedback although he conducts no research in that area himself. He is on the Board of the New York Pro Musica and has functioned as a consulting psychologist to the Electric Circus.

MARKETING MAN: THE COMPANY WOULD OBTAIN SERVICES OF AN EXPERIENCED PERSON IN HIGH LEVEL AREAS OF MARKETING TO THE PROFESSIONAL MEDICAL ELECTRONIC FIELDS. SUCH A PERSON IS AVAILABLE AND WOULD BE OBTAINED WITH CAPITAL RAISED.

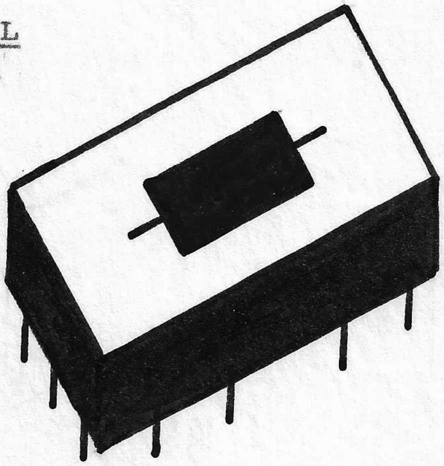
PRODUCTION ENGINEER: THE COMPANY WOULD ALSO OBTAIN AN EXPERIENCED PERSON IN MANUFACTURING AND MATERIAL CONTROL, RELIABILITY, QUALITY CONTROL AND ENVIRONMENTAL ENGINEERING TO COMPLETE THE ENGINEERING TALENT NEEDED TO PRACTICALLY OVERSEE THE PRODUCTION OF THE PRODUCTS.

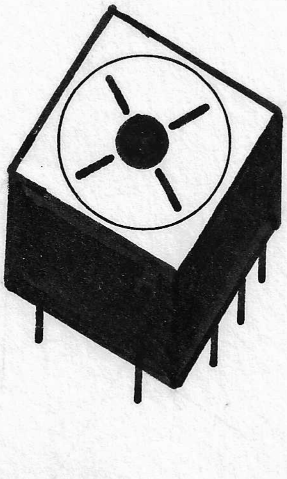
ACTUAL SIZE OF BASIC ENCAPSULATED BIO-MEDICAL CIRCUIT ELEMENTS



BIOMEDICAL OPAMP

BIOELECTRONIC SIGNAL
DETECTOR/ANALYZER





BIOLOGICAL FEEDBACK
GENERATOR

DAVID ROSENBOOM DEMONSTRATES NEW DEVICES FOR BIOFEEDBACK IN A RECENT APPEARANCE ON THE MIKE DOUGLAS TELEVISION SHOW.